EPA Review Comments and Responses

Surface Water and Sediment Trap Field Sampling Plan
Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling
Portland Harbor Superfund Site
Draft submitted to EPA dated January 17, 2018

EPA Review Comments dated February 5, 2018 (comments received 2/13/18)

Pre-RD AOC Group responses dated March 1, 2018 (blue font, italics)

Following are the United States Environmental Protection Agency's (EPA's) comments on the document titled *Portland Harbor Superfund Site, Pre-Remedial Design Investigation and Baseline Sampling, Surface Water and Sediment Trap Field Sampling Plan (*herein referred to as the FSP) prepared by AECOM Technical Services (AECOM) and Geosyntec Consultants (Geosyntec) on behalf of Portland Harbor Pre-RD AOC Group. The FSP was prepared to support the surface water and sediment trap sampling efforts outlined in the PDI Work Plan Pre-RD Investigation Studies Work Plan ([PDI Work Plan] Geosyntec 2017).

EPA understands the purpose of the FSP is to provide details on the proposed surface water and sediment trap sampling procedures necessary to generate the data needed to achieve the project-specific data quality objectives (DQOs) and data use objectives established in the FSP and the PDI quality assurance project plan (QAPP). The purpose of EPA's review is to assess if the FSP complies with the objectives of the surface water and sediment trap sampling described in the PDI Work Plan.

EPA's comments are categorized as "Primary," which identify concerns that must be resolved to achieve the objective; "To Be Considered," which, if addressed or resolved, would reduce uncertainty, improve confidence in the document's conclusions, and/or best support the objectives; and "Matters of Style," which substantially or adversely affect the presentation or understanding of the technical information provided in the document.

Primary Comments

1. The Pre-RD Group must be prepared at all times for the collection of split samples during the whole water peristaltic pump sampling and from the sediment trap composites, per EPA direction. Coordination by the Pre-RD Group to accommodate an EPA representative onboard the sampling vessel must occur prior to field mobilizations.

Pre-RD AOC Group Response: Understood. EPA's Project Manager should contact the PDI Project Coordinator to coordinate this activity and determine appropriate logistics. The Pre-RD AOC Group requests that the EPA provide an indication on the number of split samples and reasonable notification (24 hours) for collection of samples to allow field staff to accommodate the request with minimal disturbance to the field schedule.

2. A health and safety plan or addendum specific to the surface water and sediment trap sampling must be included as an attachment to the FSP. The Programmatic HAZWOPER Health and Safety Plan for the Portland Harbor Pre-RD Investigation and Baseline Sampling (AECOM 2018) states that "Because study area-specific sampling locations, methods, media, and other detailed information are to be developed for each study, safety procedures specific to that field study will be documented as an addendum to this Programmatic HASP. Each HASP Addendum will be included as an attachment to the FSP prepared for the proposed field activity." The health and safety plan must cover surface water and sediment trap sampling activities hazard analysis, diver safety, working overwater, handling acid and solvents used for cleaning high volume sampling supplies, safety and spill equipment, emergency procedures, and contact information.

Pre-RD AOC Group Response: A task hazard analysis (THA) will be developed for each unique field activity included in the project HASP. A THA specific to surface water sampling and sediment trap sampling will be developed and attached as an addendum to the project HASP. The THA will be provided to EPA a minimum of one week prior to the start of field work. This response is consistent with our response to the EPA comment for the Bathymetry Survey FSP.

3. While it is justified to utilize methods consistent with previous EPA-approved sampling plans, this FSP must serve as a stand-alone reference in the field. Accordingly, all appropriate details related to sample collection procedures must be provided in Section 4 of the FSP, and current standard operating procedures (SOPs) must be provided as an appendix. Referencing previous field sampling plans is not sufficient, and may potentially lead to confusion in instances where sampling procedures presented in previous documents are different than those in the FSP. Additionally, it is not practical for field staff to cross-reference multiple sampling plans to obtain details on different aspects of field work. Furthermore, it is unclear if the SOPs referenced in the 2002 Round 1 Field Sampling Plan, 2004 Round 2A Field Sampling Plan – Surface Water, and 2006 Round 3 Field Sampling Plan conform to current industry standards, and recent versions of SOPs must be used so that changes to industry standards are incorporated into fieldwork.

Pre-RD AOC Group Response: As per the negotiated agreement between the Pre-RD AOC Group and the EPA, the FSP utilizes previously approved FSPs and SOPs for the Site to streamline the review and approval process. The Pre-RD AOC Group appreciates EPA's concern for potential inconsistencies or confusion for field staff. Any planned variance from procedures or methods described in the referenced documents are provided in the FSP. Remedial Investigation (RI) methods that are still relevant for PDI surface water and sediment trap sampling will be included as excerpted PDF pages directly from the RI plans (if not already covered in the PDI QAPP).

4. Procedures for performing the handheld acoustical Doppler current profiler and the particle size distribution and particle concentrations using laser in situ scattering and transmissometry measurements are missing and must be provided in the FSP. Specifications for the equipment to be used, calibration procedures, and field data recording forms must be included.

Pre-RD AOC Group Response: Section 2 of the FSP text will be updated to include a citation to an SOP for performing the handheld acoustical Doppler current profiler and for the measurement of particle size distribution and particle concentrations using laser in situ scattering and transmissometry (LISST) measurements. This SOP will be consistent with manufacturer instructions and will be included as an attachment to the FSP. Specifications for the equipment to be used, calibration procedures, and field data recording forms will be included.

5. The FSP must address potential concerns of loss of volatile organic compounds (VOCs) during the transfer and compositing of peristaltic pump (PP) surface water samples in the collection carboy. Collection of surface water samples for VOC analysis and compositing them in a carboy prior to analysis is a new procedure that was not in the previously approved RI FSPs. The process could result in detections being biased low.

Pre-RD AOC Group Response: The Pre-RD AOC Group agrees; a composite sample for VOCs will be biased low. The FSP will be revised to state that the sample for VOC analysis will be a single point sample taken from the near-surface sample from the center location on each sampling transect. Surface water will be collected directly into the sampling container and will not be composited.

6. Collection of rinsate or filter blanks on the sampling filters must be included the QA/QC sampling for the PP sampling in Table 6 and dissolved organic carbon (DOC) must be included in the list of analyses for these samples. Environmental filters are typically only certified for filtering metals and anions samples and are a

potential source of carbon contamination for DOC samples. It is recommended that filters be purged before collecting DOC samples. This can be accomplished by collecting other filtered samples before DOC and/or pumping sample water through the filter before DOC collection.

Pre-RD AOC Group Response: An additional filter blank sample for the peri-pump filtered analyses will be included in Table 6 of the revised FSP. The blank sample will be analyzed for DOC. Filters will be purged with laboratory supplied de-ionized water prior to collection of DOC samples, and this will be noted in the revised FSP.

7. In Section 4.3.1, a more detailed discussion is needed regarding the rationale for selecting a 300-liter sample volume, and the ability for method detection limits to be less than ROD cleanup levels.

Pre-RD AOC Group Response: A more detailed discussion on the rationale for selecting 300 liters (L) will be added to Section 4.3.1 in the revised FSP. Specific details will include:

Based on an evaluation of the RI data collected using high volume methods, and the practical quantitation limits (PQLs) provided by Axys for the XAD-2 resin, a sample volume of 300L is estimated to be adequate to meet the ROD cleanup numbers for all constituents with the noted exception of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) TEQ. An estimated 1,000 L would be required to achieve the ROD cleanup number.

Sampling 1,000 L can be accomplished, and was during the first sampling events of the RI. However, Axys indicated that the background interferences in the XAD-2 resin when sampling such large volumes forced a dilution series that essentially negated the positive effect of the larger volume. In addition, at a flow rate of 1.5 liters per minute (L/minute) (maximum rate), the sampling would take over 12 hours of pumping. In addition to transit time to the transect locations, set-up time at each location across the transect, and filter changes, monitoring, etc., there is not adequate daylight to perform this effort.

During the stormwater sampling event, consistent with the RI efforts, volumes should be decreased to 100 – 150 L.

To be Considered Comments

1. Table 5a, page 1 of 2, last row under Surface Water-Peristaltic Pump Samples, Dissolved Organic Carbon: Phosphoric acid to a pH of less than 2 is listed as the preservative for DOC. The use of phosphoric acid should be verified because DOC samples are typically preserved with hydrochloric acid or sulfuric acid to a pH of less than 2, the same requirement as total organic carbon. Table 5a should state the timing and frequency of calibration of sondes during each of the sample collection events. Table 5a should also note that per the SOP in Appendix B, collection of XAD-2 samples will required 1-gallon Ziplock bags and 8 oz. glass jars.

Pre-RD AOC Group Response: For Table 5a of the FSP, the preservation type for DOC will be updated to "HCL or H2SO4 to pH <2" to be consistent with EPA Method 9060 and total organic carbon preservation type. Details noting the timing and frequency of calibration of sondes during each of the sample collection events will be provided in the SOP for the multiprobe (see Response to Comment 5). The "container" columns for the high-volume surface water samples in Table 5a will include 1-gallon Ziplock bags and 8-ounce glass jars.

2. Section 2, page 3, paragraph 2. In this section, Sampling Design and Approach, it states that "sediment traps will be deployed at approximately the same time intervals as the surface water sampling to capture high-flow, low-flow, and high-flow storm conditions" needs clarification. The FSP states that the sediment traps will be deployed for approximately 4-months at a time over a one-year timeframe; thus, these samples cannot be considered the same time intervals as the 1-week surface water sampling events. This statement should be

revised for clarity. It is also suggested that the second reference to "high-flow" be removed and instead referring to the third sampling event as "a stormwater event", consistent with the descriptions in Section 2.4. Section 2 should also refer to Section 2.4 for descriptions of the three flow and storm conditions that are targeted.

Pre-RD AOC Group Response: Section 2, page 3, paragraph 2 of the FSP will be revised to refer the reader to further details of the sampling schedule in Section 2.4, and the schedule paragraph will be revised for clarity. Text will be revised to clarify that the goal is for sampling to overlap sometime during each seasonal event, but the time interval/durations are not the same. The second reference to "high-flow" will be revised to refer to the third sampling event as "a stormwater event."

3. Section 2.1.2, page 5. In this subsection, Chemistry and Rationale for Sampling Locations, the first paragraph states sampling will "analyze physical changes in the river dynamics." It is not clear how the sampling in the FSP will analyze physical changes in the river dynamics. This statement should be revised. The last paragraph of Section 2.1.2 states that particle size distribution and particle concentrations will be measured using a Laser *In Situ* Scattering and Transmissometery (LISST). Additional details on how this equipment will be used should be provided in the text, and an SOP needs to be included in Appendix B that presents the set-up, calibration and operation of a LISST.

Pre-RD AOC Group Response: The statement in Section 2.1.2 will be revised to state "Surface water will be collected from seven transect locations over three sampling rounds to provide spatial coverage across the study area and evaluate a range of river dynamics (high-flow, low-flow, storm events)." Section 2.1.2 of the FSP will be revised to provide detail on the deployment and data collection for the LISST and will refer to SOP for the LISST operation.

4. Section 2.4, pages 8-9. In this subsection, Sampling Schedule, additional discussion is needed to clarify that the three surface water sampling events will be conducted during a low-flow, a high-flow and a stormwater event (as described in this section) based on actual flow and storm conditions and not strictly on timeframes selected based on historical data. Additionally, the FSP should better define what is meant by "sustained flows" and provide durations or other criteria to be met. This section should also describe how the work will be conducted to minimize the potential for resuspension of sediment during sediment trap sampling to impact surface water sampling. For example, within a given transect, surface water sampling should not be conducted on the same day as sediment trap deployment or retrieval to enable time for disturbed sediment to resettle prior to sampling.

Pre-RD AOC Group Response: Additional text will be added to Section 2.4 in the revised FSP. Specifically, the following details will be added:

- *The scheduling of sampling events will be based on flow and storm conditions; as a secondary criteria, the sampling months are provided in the FSP based on historical data and reflect the most likely timing for sampling and to provide the laboratories and vessel support a target timeframe for preparation of field equipment. However, if desired site conditions are not met during anticipated sampling months, then alternate options will be discussed with EPA (relaxation of target criteria, or sampling in a later month). Ideally, PDI sampling would be in the same months as historical data for seasonal comparability, since seasonal differences in the river system may alter contaminant concentrations.*
- *Sustained flow conditions are considered to be flow conditions lasting greater than 24 hours.*
- *Sediment traps will not be deployed or retrieved on the same days as surface water sampling to avoid disturbance of bedded sediment during surface water sampling.*

5. Section 2.5, pages 10-12. This section, Key Changes from Previously Approved RI FSPs, is helpful but the section is missing a discussion on the rationale for several of the listed changes. This justification should be included in the FSP. Further discussion is needed to define the "equally weighted volume" approach mentioned in the fourth bullet on page 10. Additionally, the SOP for the "newer model of the YSI" needs clarification. Section 2.5 has a note under the discussion of the newer model YSI of "see new SOP." However, the SOP for surface water sampling in Appendix B of the FSP refers to the SOP LPR-FI-05 and to the Multiprobe YSI SOP in the 2004 Integral FSP.

Pre-RD AOC Group Response: The Key Changes from Previously Approved RI FSPs section is provided for clarity and to avoid confusion for field staff. These changes were decided during the AOC process between the EPA and the Pre-RD AOC Group and this section is not intended to provide additional justification; however, additional details will be added regarding the rationale for changes to the AOC Work Plan (e.g., newer equipment).

The text in Section 2.5 will be revised to clarify that composite samples will be collected by sampling equal volumes from three locations along each transect. Specifically, first the water depths at each location will be measured in the field with an onboard fathometer and lead line as a backup measure. At locations with greater than 10 feet of water depth, three vertical positions will be sampled (3 feet below surface, mid-depth, 3 feet above mudline); at locations with less than 10 feet of water depth, only two vertical positions will be sampled (see FSP Table 2). The number of vertical positions at each of the three transect locations will be determined first and the total number of sampling positions for the transect summed. The total volume of water to be collected for each sample (peri-pump filtered/unfiltered and high-volume) will be divided by the total sampling positions per transect to determine the volume of water per vertical position at each location on a transect.

Section 2.5 will be revised to remove the reference to the new SOP. The Integral 2004 SOP for the Multiprobe is considered sufficient for this sampling event, as this describes the requirements for calibrations and field checks and references the specific User Manuals for multi-probes where appropriate. Therefore, we feel that this SOP is appropriate for use of any YSI model. The reference in Appendix B to the SOP LPR-FI-05 will be removed. The Integral 2004 SOP will be added as appendix to the PDI FSP.

6. The procedure for compositing the glass fiber flat filter samples and the resin columns from the high-volume surface water sampling should be described in the FSP.

Pre-RD AOC Group Response: The resin columns from the high-volume sampling are not being composited per laboratory instructions for XAD. Each column is its own sample representing the dissolved phase of constituents in the transect sample. The GFF filters and sediments from the vortex separator will be placed into one sample container and shipped to the laboratory. The laboratory will handle this as one sample representing the separated solids phase of constituents in the transect sample. The FSP will be revised to include this information.

7. Section 4.3.3, page 17, paragraph 1. This subsection, Surface Water – Field Parameters, states that the tubing intakes will be "approximately 1 foot below the datasonde". This sentence is inconsistent with text on page 2 of the SOP in Appendix B, which states that the tubing will be "6 inches lower than the sonde housing". These statements should be revised to be consistent. This section should also clarify the type weight that will be used to minimize the potential for metals contamination.

Pre-RD AOC Group Response: The text in Section 4.3.3 will be revised to be consistent with the SOP (6 inches below sonde housing). The type of weight used will be a lead weight housed in an aluminum cylinder which has been covered in a rubber coating. The rubber coating minimizes contact with metals. In addition, the tubing will be

positioned to sample up-current of the weight and sensor set allowing it to pump water that has not come in contact with any of the sensor/weight array.

8. Section 4.3.4, page 18. The sediment trap procedures in the FSP need clarification. The description of the sediment sampler deployment is inconsistent with the illustration of the sampler setup shown in Figure 3. For example, Figure 3 indicates that an anchor and anchor line will be used but there is no such description in the text of Section 4.3.4.

Pre-RD AOC Group Response: Section 4.3.4 of the FSP will be revised to provide further details of the sediment trap procedures, consistent with Figure 3.

9. Section 4.7, page 19. There is conflicting information between the waste disposal procedures described in this subsection and the procedures in Appendix B that should be clarified in the final FSP. Specifically, Appendix A calls for segregation of acid and solvent wastes and placing the wastes in drums at the onshore field facility with appropriate labels pending disposal. This information should be updated in Section 4.7. The location of the drum waste storage area should be indicated on a site plan.

Pre-RD AOC Group Response: The discussion of segregation of acid and solvent wastes and placing the wastes in drums at the onshore field facility with appropriate labels pending disposal will be provided in Section 4.7 of the FSP (or described in a new SOP). The location of the drum waste storage area will be included in Figure 1 and will be at the field processing lab.

10. Appendix A: A field equipment checklist should be provided in Appendix A.

Pre-RD AOC Group Response: A field equipment checklist is provided in the SOPs for these sampling procedures.

11. Appendix B: The SOP for High-volume Surface Water Sampling for Analysis of Organic Compounds with Low Detection Limits. The SOP is difficult to understand because it does not contain diagram(s) presenting the details of the sampling equipment and work flows. Photographs and/or diagrams could be included in the SOP to help describe the work that will be completed. The SOP should also state how the pumping systems are set-up to avoid cross-contamination. Additionally, shipments to AXYS in Canada may require at least some custom forms for transporting across the border. Such issues should be discussed along with how the effort will ensure that holding times are not exceeded.

Pre-RD AOC Group Response: The FSP will be revised to include a description of the set-up to avoid cross-contamination and photographs or diagrams of the PR-2900 system will be added to the SOP. Details on shipping to Canada and potential issues with customs and holding times will be included in the QAPP.

Matters of Style Comments

1. Section 2.5, Sampling Design and Approach section includes a sub-section that summarizes variations in sample design and collection from the Portland Harbor RI/FS (EPA 2016a, EPA 2016b), which is an effective way to capture this information. However, comparisons to the previous studies are also included throughout the FSP, which can distract from the focus on the FSP, which is to describe the details of the field sampling program to be performed. In these cases, the text should be revised to clearly define the work to be performed so there is no ambiguity to whether the previous work or the planned field work is being described.

Pre-RD AOC Group Response: The Pre-RD AOC Group appreciates EPA's concerns that discussions of previous studies may reduce overall readability. The comparisons to previous studies in the text often set the rationale for

the procedures used in the FSP and are valuable to understanding. The revised FSP will be reviewed and where there may be ambiguity relating to discussions of historical versus current sampling designs, text will be added for clarity.

2. Section 2.5, page 11, bullet 4: The fourth bullet on the page states "Teflon-line polycarbonate carboy." This typo should be corrected because it's presumed this should read "Teflon-lined".

Pre-RD AOC Group Response: Section 2.5, page 11, bullet 4 of the FSP will be revised to read "Teflon-lined."

3. Figure 1. Adding the location of the boat launch, onshore field laboratory, and investigation derived waste storage area to Figure 1 would help define the work areas in this FSP.

Pre-RD AOC Group Response: Figure 1 of the FSP will be revised to include the boat launch, onshore field laboratory, and investigation-derived waste storage area.

4. Appendix A Field Forms, the field form for the Gravity PR2900 – Water Sample Log should contain a column to record the filter IDs. The Surface Water Sampling – Water Quality Parameter Log should have a column to record turbidity.

Pre-RD AOC Group Response: The field form for the Gravity PR2900 Water Sample log will be revised to include a column to record the filter IDs. The Surface Water Sampling – Water Quality Parameter Log will be revised to include a column to record turbidity.

References:

AECOM. 2018. Programmatic HAZWOPER Health and Safety Plan Portland Harbor Superfund Site Pre-Remedial Design Investigation and Baseline Sampling. January 12.

Geosyntec. 2017. Work Plan Portland Harbor Pre-Remedial Design Investigation Studies Portland Harbor Superfund Site. December 14.